**CLAIMS**

What is claimed is:

1. A method of correcting measurement data obtained from a multi-channel imaging system, comprising the steps of:

a) producing a sub-image in each channel of the system using a predetermined wavelength;

b) measuring a geometric distortion introduced by the system in each sub-image;

c) determining a geometric correction matrix corresponding to said geometric distortion introduced by the system in each sub-image; and

d) applying said geometric correction matrix to remove geometric distortion from measurement sub-images produced by the system.

2. The method of Claim 1, wherein said step b) is carried out by:

dividing each sub-image produced by the system into a plurality of sub-regions;

measuring a geometric distortion introduced by the system in each sub-region of each sub-image;

determining a correction factor corresponding to said geometric distortion introduced by the system in each sub-region of each sub-image; and

using said correction factor for each sub-region of each sub-image to calculate a correction coefficient for each sub-image pixel and to produce a corresponding correction matrix for each sub-image.

3. The method of Claim 2, wherein said measuring step is carried out by measuring a spatial displacement with respect to a predetermined reference position of an image feature in each sub-region of each sub-image produced by the system; and said determining step is carried out by calculating correction factors as required to negate said spatial displacement in each sub-region of each sub-image produced by the system.

4. The method of Claim 3, wherein said step of measuring a spatial displacement includes the use of a cross-correlation algorithm for each sub-region of each sub-image.

5. The method of Claim 3, wherein a surface equation is fit through said correction factors and said correction coefficient is obtained from the surface equation.

6. The method of Claim 5, wherein said surface equation is a polynomial.

7. The method of Claim 1, wherein said step b) is carried out by comparison of each of said sub-images with a calibration test pattern.

8. The method of Claim 1, wherein said geometric distortion is measured using one of said sub-images as a reference.

9. The method of Claim 1, further including the step of repeating steps (a) through (c) using a different wavelength prior to carrying out step (d).

10. The method of Claim 1, further including the following steps prior to carrying out step (d):

measuring an intensity distortion introduced by the system in a plurality of pixels in each sub-image;

determining a transfer-function correction matrix to produce a uniform intensity response across each of said plurality of pixels; and

applying said transfer-function correction matrix to remove intensity distortion from measurement sub-images produced by the system.

11. The method of Claim 2, further including the following steps prior to carrying out step (d):

measuring an intensity distortion introduced by the system in a plurality of pixels in each sub-region of said sub-image;

determining a transfer-function correction matrix to produce a uniform intensity response across each of said plurality of pixels in each sub-region of said sub-image; and

applying said transfer-function correction matrix to remove intensity distortion from measurement sub-images produced by the system.

12. A multi-channel imaging system, comprising:

a) means for producing a sub-image in each channel of the system using a predetermined wavelength;

b) means for measuring a geometric distortion introduced by the system in each sub-image;

c) means for determining a geometric correction matrix corresponding to said geometric distortion introduced by the system in each sub-image; and

d) means for applying said geometric correction matrix to remove geometric distortion from measurement sub-images produced by the system.

13. The system of Claim 12, wherein said measuring means includes:

means for dividing each sub-image produced by the system into a plurality of sub-regions;

means for measuring a geometric distortion introduced by the system in each sub-region of each sub-image;

means for determining a correction factor corresponding to said geometric distortion introduced by the system in each sub-region of each sub-image; and

means for using said correction factor for each sub-region of each sub-image to calculate a correction coefficient for each sub-image pixel and to produce a corresponding correction matrix for each sub-image.

14. The system of Claim 13, wherein said measuring means further includes means for measuring a spatial displacement with respect to a predetermined reference position of an image feature in each sub-region of each sub-image produced by the system; and said determining means includes means for calculating correction factors as required to negate said spatial displacement in each sub-region of each sub-image produced by the system.

15. The system of Claim 14, further including means for fitting a surface equation through said correction factors and for obtaining said correction coefficient from the surface equation.

16. The system of Claim 15, wherein said surface equation is a polynomial.

17. The system of Claim 12, wherein said means for measuring said geometric distortion utilizes a predetermined test pattern as a reference.

18. The system of Claim 12, wherein said means for measuring said geometric distortion utilizes one of said sub-images as a reference.

19. The system of Claim 12, further including means for changing said wavelength.

20. The system of Claim 12, further including:

means for measuring an intensity distortion introduced by the system in a plurality of pixels in each sub-image;

means for determining a transfer-function correction matrix to produce a uniform intensity response across each of said plurality of pixels; and

means for applying said transfer-function correction matrix to remove intensity distortion from measurement sub-images produced by the system.

21. The system of Claim 13, further including:

means for measuring an intensity distortion introduced by the system in a plurality of pixels in each sub-region of said sub-image;

means for determining a transfer-function correction matrix to produce a uniform intensity response across each of said plurality of pixels in each sub-region of said sub-image; and

means for applying said transfer-function correction matrix to remove intensity distortion from measurement sub-images produced by the system.

22. A method of correcting measurement phase data obtained from a multi-channel interferometric imaging system, comprising the steps of:

a) producing a set of sub-images, each sub-image in said set corresponding to a channel of the system;

b) calculating a phase map from said set of sub-images;

c) repeating steps (a) and (b) a plurality of times, each time introducing a phase offset in said set of sub-images, thereby producing a plurality of additional phase maps;

(d) averaging said phase map and said additional plurality of phase maps to produce a corrected phase map.

23. The method of Claim 22, wherein said phase offset is random.

24. The method of Claim 22, wherein said phase offset is introduced in a reference path length.